

TAXONOMICAL ANALYSIS OF AGRICULTURAL MODERNITY OF FARMERS

By

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THESIS

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VELLAYANI, THIRUVANANTHAPURAM
1995**

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I hereby declare that this thesis entitled "**Taxonomical Analysis of Agricultural Modernity of Farmers**" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of any other University or Society.

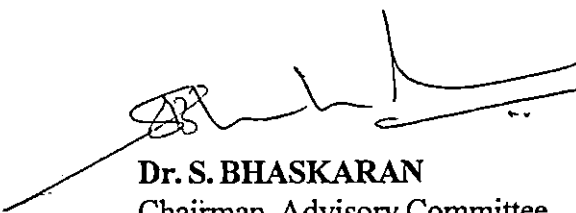
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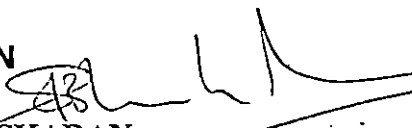
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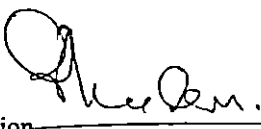
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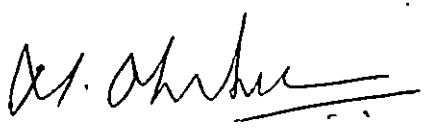
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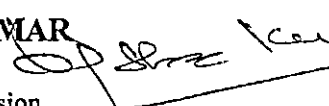


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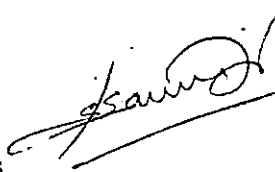
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LIST OF ABBREVIATIONS

CAMI	-	Composite Agricultural Modernity Index
IDB	-	Information Dissemination Behaviour
ISU	-	Information Source Utilisation
HYV	-	High Yielding Variety
SAU	-	State Agricultural Universities

INTRODUCTION

INTRODUCTION

Underdevelopment is not just a collection of statistical indices. It is also a state of mind.

– Dr. Salazar Bondy¹

Development as applied to the specific context of rural India is generally termed as rural development. Fundamentally, development of a rural area means not only the aggregate development of the area, but also the development of the people living in it. Rural development, over the years, has emerged as a strategy designed to improve the economic, social and cultural life of the rural people. It aims at transforming the traditional agrarian rural society into a modern agro based egalitarian society. Thus rural development means all aspects of all round human development in a rural area².

The key dimension of rural development is undoubtedly the development of agriculture and allied sectors. Quite often, modernisation of traditional agricultural societies is considered synonymous with technological progress. Rapid economic and social progress is expected as an immediate consequence of "introducing" a modern technical package. Yet, no matter how important the technological modernisation might be, it does not on its own, ensure development, as many naively think. The impossibility of effecting genuine development through technological transfer has been confirmed by a number of agricultural development schemes that have channeled their investments into technology, fully ignoring the human element.

As it stands, socio-psychological and cultural aspects of the 'ryots' are not given due attention with regard to agricultural development. Any technology transfer must therefore be designed and implemented within a frame work of understanding how the basic socio-economic unit, namely,

1. In his unpublished contribution to the conference on "Alternatives in development" sponsored by the Vienna Institute for Development on June 1971, Dr. Salazar Bondy, a leading intellectual of Peru made the following remark.

2. The United Nations Development Programme (UNDP) has even formulated an Index of Human Development (HDI). Refer *Human Development Report 1990* Oxford University Press, New York.

the individual farmer, functions in his environment.

As new breakthroughs occur in agricultural science and technology, modern agricultural practices become more achievable, and desirable behavioural change among farmers in accordance with the technological advances become all the more indispensable. Thus repatterning³ of behaviour by the farmer himself is one of the prime requisites of agricultural modernisation.

It is an already accepted notion that modernity itself is a socially desirable and strategically designed behavioural modification of the farmer. The relative rating of a farmer's modernity therefore assumes paramount importance in any serious development agenda. But the identification of modernity status of a farmer is by no means an easily amenable sociometric process. Any research attempt towards this direction is hence increasingly felt plausible.

Need of the Study

While it is apparent that most studies on agricultural modernisation have paid explicit attention to studying societal or village level units, there are fewer number of impressive studies which have concerned themselves with studying the individual farmers. Investigators envision that attitudinal modernisation or modernity of individual farmers is a pre-requisite to other types of agricultural modernisation like say, mechanisation. The primary task of an extension agent is to change the individual farmer, who in turn ultimately decides whether to change his farm or not. This research is based on the premise that any study of agricultural modernisation should therefore focus on the behavioural components of the individual farmer. An attempt on these lines is made with the following objectives.

1. To develop a composite agricultural modernity index (CAMI).
2. To assess the extent of agricultural modernity of farmers.

3. See Leagan's concern on repatterning of farmer's behaviour. Leagans P.J and Loomis P.C. 1971. *Behavioral change in Agriculture - Concepts and Strategies For Influencing Transition*. Cornell University Press, London.

3. To explore the relationship between the psychographics of farmers and their modernity.
4. To analyse the factors influencing agricultural modernity.

Scope of the study

The development of the agricultural modernity index based on psychological modernity is a pioneering attempt and is a contribution to the field of agricultural extension. The determinants and factors being identified, would help the extension worker to focus on them, so that a more modern farmer is evolved.

This study acts as a useful aid in determining the relative position of a farmer in a modernity continuum. It is entertained as well as hoped that this scientific understanding might be of immense help in formulating wise policies and effective strategies for agricultural development.

Limitations of the work

This study is no exception to the limitations of time, which a student researcher would normally encounter. It is also limited by the paucity of studies concerning agricultural modernity. Further the study covered only a single Panchayat. To this extent, the findings of the study should be viewed with some degree of tentativeness. Despite all these constraints, every care has been taken to make the study as objective as possible.

Presentation of the thesis

The presentation of the remaining chapters of the thesis is as follows. *Chapter-II* provides theoretical orientation to the study. *Chapter-III* is devoted to the methodology of research in which selection of study area, sampling procedure, operationalisation and measurement of variables, method of data collection and statistical tools used are elucidated *Chapter-IV* furnishes the results of the study while *Chapter-V* covers their discussions. Finally *Chapter-VI* describes the summary of the research work emphasising the salient findings. The references and appendices are given at the end.

THEORETICAL ORIENTATION

In the best books, great men talk to us, give us their most precious thoughts and pour their souls into ours.

— *W.E. Channing*

THEORETICAL ORIENTATION

This chapter is devoted to a retrospective analysis of the available literature related to the present study. It is intended to serve as a background and to provide a theoretical framework of the various concepts related to this study. The review has been organised under the following sub heads.

2.1 Review of concepts

2.1.1 Modernisation

2.1.2 Individual modernity

2.1.3 Agricultural modernisation

2.2. Taxonomical analysis of agricultural modernity

2.2.1 Socio-psychological behaviour

2.2.2 Adoption behaviour

2.2.3 Communication behaviour

2.2.4 Economic behaviour

2.3 Relationship of psychographics with agricultural modernity.

2.4 Relationship of factors with agricultural modernity.

2.1 Review of concepts

2.1.1 Modernisation

The concept of 'Modernity' has emerged as one of the Central themes in social analysis. The term 'Modern' though originally used in

Latin is now applied not only to men, but to nations, to political systems, to economies, to arts and to institutions. Taken literally, the word 'modern' refers to anything which has more or less recently replaced something, which in the past was the accepted way of doing. (Inkeles and Smith 1974).

Contemporary literature on modernisation has a diverse heritage of research and thought. Many disciplines have attempted to discuss the concept of modernisation in their own framework. Of these Economics, History, Political Science and Sociology are particularly important.

In social science however, the term "modernisation" should be conceived as a societal or macrosocial process, whereas "modernity" refers to properties of individuals within societies regardless of the degree of modernisation of those societies. (Inkeles 1983). Inkeles' summation provides a useful starting point for this study. Thus "agricultural modernity" refers to characteristics of an individual farmer and agricultural modernisation, refers to that of a society.

Like any other concept, modernisation theories propounded and research conducted have been varied and carry a heavy weight of connotations. For instance modernisation has been equated to 'Westernisation' (Hall 1965; Weiss 1977; Chiba 1978). Although it has been admitted that apparent influences of the western world do exist, arguments that elements of a country's traditional culture may even be helpful for the achievement of modernisation also prevail. (Gusfield 1967; Portes 1973). Similarly modernisation has been treated as a conceptual cousin of "industrialisation" (Moore 1963; Cheung 1979; Vago 1989) and has been

made even synonymous with value replacement (Black 1967; Stephenson 1969; Singh 1970).

The specific concerns of modernisation theorists, have been with the assumed relationships of structures and functions of societies and with describing the changes which occur over a period of time. Of many streams of thought on the concept of modernisation, four are easily discernible. The first orientation involves plausible relationships among urbanisation, literacy, media participation and development (Lerner 1958). The second orientation involves the institutional structure of societies, which either promote or retard the process of modernisation (Eisenstadt 1964; 1967). The third orientation is concerned with the basic distinctions between relatively modernised and non modernised societies (Levy 1966; Horowitz 1966). The fourth orientation treats modernisation in terms of flexibility of the social system (Deutsch 1962; Apter 1965; Bellah 1965).

Reviewing the operational similarities and dissimilarities between the various approaches, the following conceptualisation is proposed.

Modernisation is conceptualised as the "diffusion of and replacement by new ideas over a period of time in a social system leading to differentiated and flexible social structures and whose people become available for new patterns of behaviour".

2.1.2 Individual modernity

Social scientists believe that universals or commonalities of a modern society are associated with values, attitudes and behaviour of the

people living in them. Since there is a constant interplay between the personality system and the social system, one can reasonably speak of mental orientations and behavioural styles which can distinguish a modern man from a traditional one.

On the whole however; modernisation studies have dealt mainly with societal-level variables, where the focus was on the society - its systems and institutions.

Attention later shifted focus on to the micro level variables ie., the study of individual modernity. The concept of individual modernity which is a socio-psychological construct thus became an important variable to sociologists interested in the study of modernisation. (Kahl 1968; Inkeles and Smith 1966).

Central to the individual modernity theory is the assumption that psychological modernity leads to modern behaviour which contributes to or is necessary for modernisation of societies. (Lerner 1958; Peshkin and Cohen 1967; Kahl 1968; Inkeles 1971; Chodak 1973; Portes 1976; Porter and Cobas 1976).

Various modernity scales were then proposed to measure attitudes and behaviour of individuals (Inkeles and Smith 1966; Kahl, 1968; Schnaiberg 1970; Armer and Youtz 1971) of which the OM (overall modernity) scale developed by Inkeles and Smith stands out as a trail blazer. Scientists envisioned that if those attitudes and beliefs, constituting individual modernity could be identified and isolated, significant policy implications could be drawn (Klineberg 1973; Carlos 1974; Kumar and Waisanen 1979).

Individual modernity is operationally defined as a “set of attitudes, beliefs and behaviour especially characterising individuals in a highly educated setting”.

2.1.3 Agricultural modernisation

The terms ‘Agricultural modernisation’ and ‘Agricultural modernity’ have been used synonymously in most works. In fact no literature refers to the term ‘Agricultural Modernity’ which lays emphasis on the individual farmer. But some of the agricultural modernisation studies albeit few in number are reviewed.

Rogers (1969) employed nine variables to study modernisation among Colombian peasants. They were literacy, mass media exposure, cosmopolitanism, empathy, achievement motivation, fatalism, innovativeness, political knowledge and aspiration.

Vyas *et al.* (1969) constructed a composite index which was utilised by Mohan *et al.* (1986), to assess the level of agricultural modernisation which included the following indicators - stepping up of cropping intensity, larger area under high yielding variety (HYV), increase in the per acre application of fertilizers, increased expenditure per acre on plant protection measures, increase in acre brought under new crops, increase in capital investment in the shape of irrigation, ploughing and other farm equipment.

Murthy (1991) developed an agricultural modernisation index using the following components - total land holdings, source and system of irrigation, value of the produce, use of high yielding varieties, adopting plant protection measures, total number of labourers hired, farm assets and livestock.

Rajkumar (1992) constructed an agricultural modernisation index taking ten indicator categories *viz.*, land utilisation, cropping system, integrated farming system, farm mechanisation, resource use pattern, marketing behaviour, Service utilisation, allied farm activities, media utilisation and maintenance of farm records.

Agricultural modernity of an individual farmer is conceptualised as "a dynamic and complex multi-dimensional syndrome embracing a wide gamut of his attitudes, values and ways of acting towards agriculture".

2.2. Taxonomical analysis of agricultural modernity.

The human being is by nature a classifying animal, as his functioning and survival seem to have depended on his ability to recognise and communicate similarities and differences between objects and events in his universe. Taxonomy is defined as the theory and practice of classifying organisms (Mayr 1969) and involves two basic scientific function (1) the description of objects of interest or under investigation and (ii) the establishment of general laws on theories by means of which particular events may be explained and predicted (Hempel 1965).

Taxonomical analysis of modernisation process has been carried out by theorists by propounding various components or taxons (Mayr 1969) which either make up or aid the modernisation process. This has been done under the assumption that a taxonomy can represent a model of reality and as such, can embody or reflect a theory about how a particular domain is structured and how it works (Fabrega 1976).

A brief examination of the taxonomies of modernity propounded by various scientists are presented.

Taxonomies of modernity

Inkeles and Smith 1966		Singh 1976	
<i>Analytic perspective</i>	Aspirations Growth of opinion Information Change orientation Efficacy New experience	<i>Psychological</i>	Motivation attributes Innovativeness
<i>Topical perspective</i>	Public participation Media participation Citizen ship Family size	<i>Normative</i>	Norms and values
<i>Behavioural perspective</i>	Political activity Arithmetic test Consumption behaviour Information test Religious activity	<i>Structural</i>	Money, Market complex Democratic association
Black 1967		<i>Technological</i>	Material input Developing infrastructure
<i>Intellectual</i>	Scientific values Religious beliefs	Armer and Issac 1978	
<i>Political</i>	Political affiliation	<i>Back ground factors</i>	Age Education Residence Occupation Income
<i>Economic</i>	Economic motivation	<i>Societal Modernising factors</i>	Communication Religious belief Political affiliation Economic characters
<i>Social</i>	Media participation Communication Education	Zeigler 1983	
<i>Psychological</i>	Attitudes Adaptability Initiative Empathy	<i>Socio-psychological</i>	Attitude Education Human concerns
Madoo 1969		<i>Socio economic</i>	Economic achievement
<i>Primary indicators</i>		<i>Education</i>	Knowledge Education
<i>(Variables of central importance)</i>	Occupation Management Education	<i>Societal features</i>	Communication Urbanisation Industrialisation
<i>Secondary indicators (Variables of influence)</i>	Organisational involvement Media exposure		

In fact, the personal qualities defined as modern in many different taxonomies show a remarkable degree of overlap. They may be summed up into socio-psychological behaviour, economic behaviour and communication behaviour.

The unique role of adoption behaviour in modernising the individual farmer has long been recognised, and has predominated most agricultural modernisation studies (Vyas *et al.*, 1969; Jaiswal and Dave 1972; Bhaskaran 1978; Mohan *et al.* 1986; Murthy 1991). In the following taxonomy proposed for agricultural modernity the component adoption behaviour is blended with the aforesaid components. This goes with the principle that one does not judge the classificatory method on the *apriori* beliefs of the taxonomist, but on the usefulness of the results — a view endorsed by Ruse (1973).

Thus the following components of agricultural modernity are derived from the review.

1. Socio-psychological behaviour
2. Adoption behaviour
3. Communication behaviour
4. Economic behaviour

Through a close scrutiny of literature related to the taxonomies of agricultural modernity, the most appropriate determinants are delineated and diagrammatically represented here under.

The analysis of agricultural modernity is dealt in detail here under. Dearth of literature concerning relationship between the different variables and agricultural modernity has necessitated the borrowal and use of adoption studies wherever applicable.

2.2.1 Socio-psychological behaviour

A review of pertinent literature on the determinants of the various components are delineated. Studies on determinants associated with socio-psychological behaviour of education, knowledge and attitude towards scientific cultivation are furnished.

2.2.1.1 Education

There is a large body of evidence to support the proposition that modern ideas, attitudes and values are found more frequently among the better educated. So far as we know, Lerner (1958) was the first to articulate a model of modernisation and explain the role of education in it. Other studies which looked upon education as an initiator of modernity were Tumin and Arnold's study (1961) in Puerto Rico and Kahl's (1968) investigation in Brazil and Mexico. While the early research by Mosher (1966) gave education for farm people, the status of 'accelerators' of agricultural development, Roger's (1969) study of Colombian peasants strengthened the role of functional literacy in agricultural modernity.

In their monumental study of individual modernity, Inkeles and Smith (1966) emphasised that school modernises individual more than any factor which was later proved by Kumar (1972), Portes (1973), and Armer and Issac (1978).

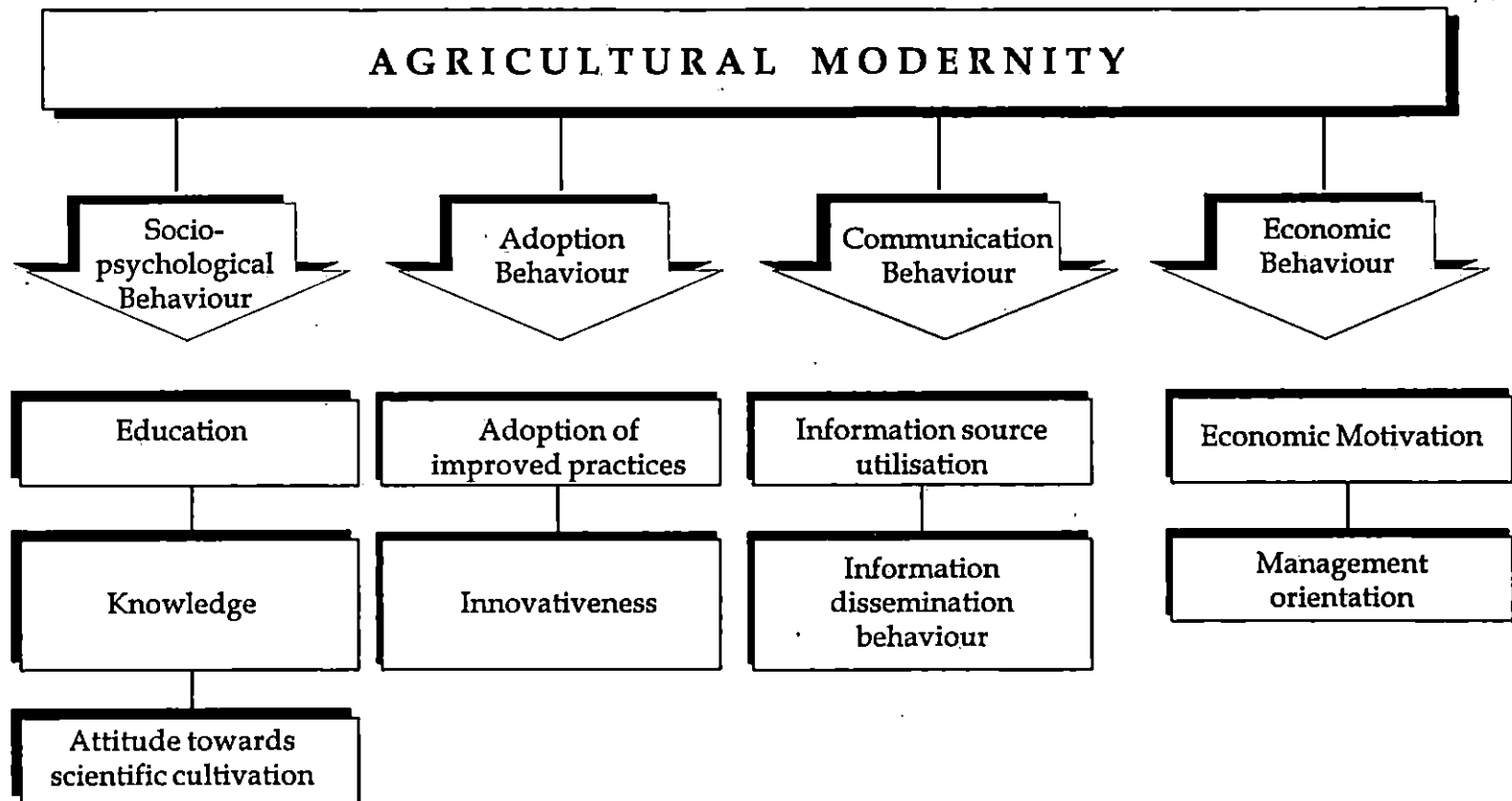


Fig. 1. Taxonomy of agricultural modernity

In adoption studies in agriculture, though some of the findings have revealed non significant relationship of education with adoption (Rathinasabapathy 1987; Jayaraman 1988; Krishnamoorthy 1988; Sharma 1988), there are innumerable findings which provide empirical support to the positive influence of education on agricultural modernity (Venkatapirabhu 1988; Adhiguru 1991; Babu *et al.* 1992; Raj Kumar 1992).

2.2.1.2 Knowledge

Impressive contributions of scientists stressing the importance of knowledge of improved practices in agriculture have grown over the years. Rogers (1969) employed practical knowledge as one of the variables for peasant modernisation. Knowledge of innovations significantly contributed to explaining adoption behaviour of farmers (Singh & Singh 1970; Rogers and Shoemaker 1971; Sethy *et al.* 1984). In related studies progressiveness of farmers was measured by taking knowledge of improved practices as one of the components of progressivism (Jaiswal and Dave 1972; Bhaskaran 1978). Reviews of works on individual modernity (Inkeles and Smith 1974; Zeigler 1983) also give ample evidence in support of the importance of information in identifying the modern man.

2.2.1.3 Attitude towards scientific cultivation

Individual modernity has been defined by theorists as 'changed attitude and beliefs'. (Inkeles and Smith 1966; Schnaiberg 1970; Kumar 1972) bringing to light the fact that individual modernity undergoes a change only if the attitudes of the people are changed. Attitude towards scientific cultivation was the prime theme which tapped the dimensions

of farmer's progressivism (Roy 1965; Tellis Nayak 1973; Singh 1978). Several adoption studies have pointed out the importance of attitude in agricultural modernisation. Most results have shown positive influence of adoption with attitude towards scientific cultivation (Rathinasabapathy 1987; Venkitapirabhu 1988; Sajeevchandran 1989; Sutha *et al.* 1991; Raj Kumar 1992). However some workers have pointed out nonsignificant relationship of attitude with adoption. (Jayapalan 1985; Ramasamy 1987; Jayaraman 1988).

2.2.2 Adoption behaviour

A review of studies on the determinants of adoption behaviour *viz.* Adoption of improved agricultural practices and innovativeness is furnished.

2.2.2.1 Adoption of improved agricultural practices

Several researchers have shown interest in adoption studies as determinants of progressiveness but like modernisation studies, they have dealt mainly with societal level variables. The criteria for classification of villages into progressive and non progressive villages have more often been dominated by adoption of HYV or adoption of fertiliser consumption (Shankariah 1969; Singh & Sahay 1970; Singh & Prasad 1974; Kalamegam 1975).

Scientists have also focussed on the measurement of progressiveness of farmers using adoption as component. (Jaiswal and Dave 1972; Rahiman 1978; Bhaskaran 1978). Adoption of modern techniques was taken as a development indicator by Jaleel (1992) and in a study of

agricultural modernisation Rajkumar (1992) found highly significant and positive relationship of modernisation with adoption of improved agricultural practices.

2.2.2.2 Innovativeness

There is a great deal of unanimity among theorists that innovativeness, which is the degree to which an individual is ready to adopt new ideas, relative to others in his social system, is a character closely associated with individual modernity. (Inkeles and Smith 1966; Kumar 1972; Waisanen and Kumata 1972). Similar works in agricultural modernisation also suggest that innovativeness has contributed to farmers modernity. (Roy 1965; Rogers 1969; Jaiswal and Dave 1972; Tellis - Nayak 1973; Rajkumar 1992).

2.2.3 Communication behaviour

Studies related to the determinants of communication behaviour *viz.* information source utilisation (ISU) and information dissemination behaviour (IDB) are presented.

2.2.3.1 Information source utilisation (ISU)

Communication is a powerful stimulus for peasant modernisation and social change. (Lerner 1958; Rogers and Svenning 1969). Information source utilisation has been a common concern for social scientists and divergent perspectives regarding utilisation of information sources have been proposed.

The overwhelming power of mass media in influencing individual modernity has been highlighted. (Kahl 1968; Rogers 1969; Inkeles and Smith 1966; Kumar 1972; Rajkumar 1992). On the other hand many theorists have given strong evidences to prove the importance of interpersonal communication as an effective information source. (Deutsman and Falsborda 1962; Rahim 1965; Frey 1966; Bhatnagar 1976; Bhaskaran 1979; Kennedy 1980; Zeigler 1983).

Information source utilisation as a component for measuring progressiveness of farmers was used by Roy (1965). Several scientists have also reported that progressiveness of farmers (Danda 1972; Dwarakinath *et al.*, 1975; Bhaskaran 1978; Shilaja 1981; Jaleel 1992) are characterised by frequent external agency contact. Progressive farmers themselves are often found acting as credible sources of information (Sandhu 1970; Babu 1971; Earnest 1973; Ambastha 1974; Annamalai 1979; Bhilegaonkar 1980).

2.2.3.2 Information dissemination behaviour (IDB)

Information dissemination is being regarded as a necessary communication behaviour among farmers which adds to farmer's modernity. Singh (1972) found that 84% of the farmers surveyed discussed the contents of farm broadcasts with family members and friends. While Sherief (1985) reported that most of the feedback from noncontact farmers were mainly communicated to other farmer, Subramaniam (1986) observed that it was while 'personal talk during home visit' that majority of farmers communicated messages to other farmers.

2.2.4 Economic behaviour

Pertinent literature regarding the determinants of economic behaviour namely economic motivation and management orientation are provided.

2.2.4.1 Economic Motivation

Review of studies showing relationship between economic motivation and adoption.

No.	Name of researcher	Area of research	Year	Relationship
1.	Jayapalan	Rice seed production	1985	N.S.
2.	Ramasamy	Turmeric	1987	N.S.
3.	Krishnamoorthy	Seed treatment in cotton	1988	N.S.
4.	Sajeev chandran	Pepper cultivation	1989	P.S.
5.	Sutha <i>et al.</i>	Rubber cultivation	1991	P.S.
6.	Rajkumar	Agricultural modernisation	1992	N.S.
7.	Gangadharan	Pepper growers	1993	P.S.

N.S. - Non significant

P.S. - Positively significant

2.2.4.2 Management orientation

Review of studies showing relationship between management orientation and adoption.

No.	Name of researcher	Area of research	Year	Relationship
1.	Samantha	Agricultural credit	1977	P.S.
2.	Shanmukhappa	Arecanut growers	1978	P.S.
3.	Bhaskaran	Interpersonal communication	1979	P.S.
4.	Sheshachar	Chilli cultivators	1980	P.S.
5.	Kamarudeen	National demonstration	1981	P.S.
6.	Ramachandran	Mini Kit Trials	1992	P.S.

P.S. - Positively significant

2.3 Relationship of psychographics with agricultural modernity

The term psychographics is being used by many researchers as a collective synonym for psychological variables and life style values (Stanton and Futrell 1987).

2.3.1 Satisfaction

Couvillion (1992) observed that individual modernity had positive relationship with the variables, satisfaction with life and level of living in the Laguna area, Mexico.

Saunders (1969) conducted modernisation studies in Brazil and constructed a "Satisfaction with life" inventory.

Waisanen and Kumata (1972) considered satisfaction as an indicator of individual modernity.

Sinha and Sharma (1980) identified the dimensions of satisfaction and constructed a scale for measuring happiness.

2.3.2 Calculability

Foster (1967) observed with regard to the Mexican peasant. "So deep is the suspicion and mistrust of others, that it is difficult for people to believe that no hidden meaning underlies even the most casual acts".

Inkeles and Smith (1966) for constructing the Overall Modernity scale included calculability as a sub dimension under efficacy.

Kumar (1972) found calculability having positive correlation with individual or psychological modernity.

2.3.3 Social Participation

Review of research studies showing relationship between social participation and adoption.

No.	Name of researcher	Area of research	Year	Relationship
1.	Ravichandran	Sugarcane growers	1980	P.S.
2.	Kamarudeen	National demonstration	1981	P.S.
3.	Prasannan	T&V system	1987	P.S.
4.	Anithakumari	TOT on pulses & oil seeds	1989	N.S.
5.	Gangadharan	Pepper cultivation	1993	P.S.

P.S. - Positively significant N.S. - Non significant

2.3.4 Fatalism

Review of Studies showing relationship between fatalism and adoption

No.	Name of researcher	Area of research	Year	Relationship
1.	Aurora and Deb	Green revolution	1973	Neg. S.
2.	Kolte	Farm mechanisation	1973	Neg. S.
3.	Sharma & Nair	Adoption of HYV of paddy	1974	Neg. S.
4.	Moulik	Developmental change	1975	Neg. S.
5.	Singh & Sohal	Value orientation	1976	Neg. S.
6.	Dasgupta	Diffusion	1989	Neg. S.

Neg. S. - Negatively significant

2.3.5 Environmental orientation

Naidu (1993) observes "optimal use of environmental resources in the key word for development, as other wise it would tell upon the basic life support system of our planet, so that the progress of mankind and preservation of ecology go hand in hand".

Acharekar (1993) pointed out that although initially environmental safety aspects had been virtually ignored, recently greater environment concern was being expressed.

Nair (1994) emphasises in his essay on environment and development "We are in need of a system which endeavours to create a way of thinking, requiring people to overcome prejudices and to develop an open way of looking at things around them. Thus the individuals and the community would gain awareness of the environment and require the needed skills to solve problems".

2.4 Relationship of factors with agricultural modernity

Factors are elements that affect the agricultural modernity. These factors play a pivotal role in accelerating and decelerating the process of agricultural modernity.

2.4.1. Review of Research studies showing relationship between cosmopolitanism and risk orientation with adoption

No.	Name of researcher	Area of research	Year	Relationship with Adoption	
				Cosmo-politeness	Risk orientation
1.	Kamarudeen	National demonstration in paddy	1981	P	-
2.	Viju	Tribal farmers	1985	P	-
3.	Prasannan	T&V	1987	P.S.	P
4.	Anithakumari	TOT on pulses and oil seeds	1989	-	P.S.
5.	Sutha <i>et al.</i>	Rubber growers	1991	P.S.	P.S.
6.	Jaleel	Tribal farmers	1992	P.S.	P.S.
7.	Rajkumar	Agricultural modernisation	1992	-	N.S.
8.	Gangadharan	Pepper cultivation	1993	P.S.	P.S.

P - Positive P.S. - Positively significant N.S. - Not significant

2.4.2. Review of Research studies showing relationship of adoption with farm size and farming experience

No.	Name of researcher	Area of research	Year	Relationship with Adoption	
				Farm size	Farming Experience
1.	Jeyakrishnan	Paddy, low cost technology	1984	N.S.	P.S.
2.	Jayapalan	Rice seed production	1985	N.S.	P.S.
3.	Ramasamy	Turmeric	1989	N.S.	N.S.
4.	Jayaraman	Neem coated urea	1988	N.S.	N.S.
5.	Venkitapirabhu	Water management practices	1988	N.S.	N.S.
6.	Adhiguru	Rice growers	1991	-	N.S.
7.	Sutha <i>et al.</i>	Rubber growers	1991	-	N.S.
8.	Rajkumar	Agricultural modernisation	1992	P.S.	N.S.

P.S. - Positively significant N.S. - Not significant

2.4.3. Review of research studies showing relationship of credit behaviour with adoption

No.	Name of researcher	Area	Year	Relationship with adoption
1.	Suryawanshi <i>et al.</i>	Credit requirements	1978	P
2.	Manjunatha	Village adoption	1980	P
3.	Reddy <i>et al.</i>	Credit and Farm economy	1982	P
4.	Nandakumar	Tribal community	1988	N.S.
5.	Jaleel	Tribal farmers	1992	N.S.

P - Positive

N.S. - Non significant

2.4.4 Number of Enterprises

Thorve and Galgalikar (1985) and Chandramouleeswaran (1987) found that majority of the farmers had gone for dairying in addition to growing crops.

Sharma (1988) found that in South Andaman islands, there were 27 different types of enterprise combinations adopted by farmers. The most preferred combination among farmers were (crop + Poultry + dairy) (crop + plantation + poultry + dairy) and (crop + poultry + dairy + goat).

Iqbal (1992) found that in Coimbatore district, big farmers had more number of milch animals, goats, backyard poultry as well as sheep units. Small farmers and marginal farmers were found to possess a higher average

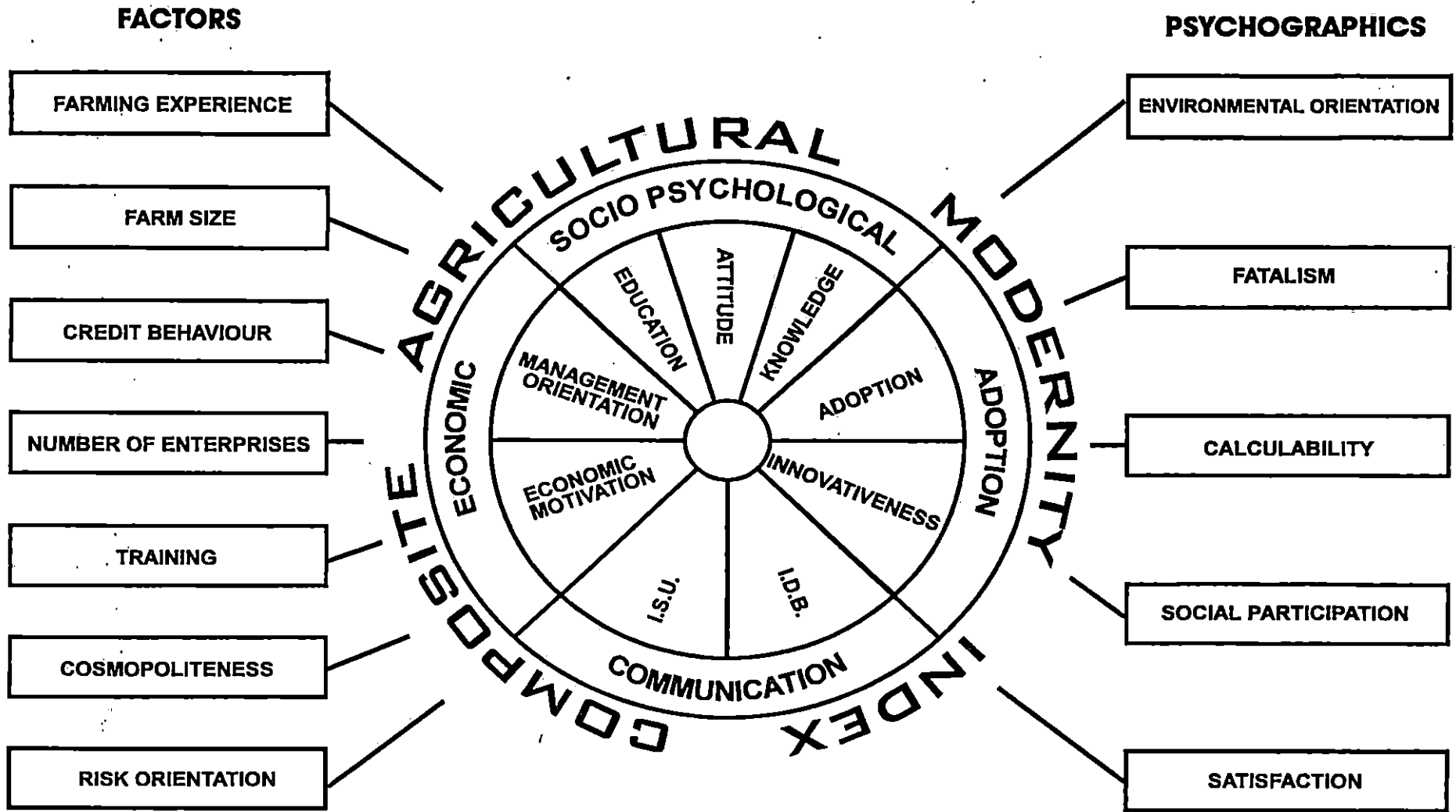


Fig. 2. Conceptual model

number of milch animals and backyard poultry. Both small and marginal farmers possessed a higher average number of goats than small farmers.

Rajkumar (1992) found that integrated farming system had highly significant relationship with modernisation as well as adoption. This was also a component of the agricultural modernisation index developed. Maximum of four enterprises were integrated by farmers. More than half of the farmers had four enterprises followed by two fifth who had three enterprise combinations. Most of the farmers in high modernity level integrated three enterprises and most of the medium and low modernity level farmers integrated two enterprises.

2.4.5 Training

Review of research showing positive relationship of training with behavioural components and Adoption

No.	Name of researcher	Year	Variables
1.	Little field <i>et al.</i>	1971	Knowledge, Attitude and Skill
2.	Kamalsen	1971	Knowledge, Attitude
3.	Singh	1974	Knowledge
4.	Gagni	1978	Behaviour
5.	Vashistha	1987	Adoption

METHODOLOGY

"While the individual man is an insoluble puzzle, in the aggregate he becomes a mathematical certainty".

– Sherlock Holmes in *The Sign of Four*

METHODOLOGY

According to Kerlinger (1983), in a research design the strategy of investigation conceived so as to obtain answers to the research questions, needs great attention. This chapter deals with the brief description of the methods and procedures followed in the study. The various aspects included in this chapter are presented under the following sections.

- 3.1 Locale of research
- 3.2 Sampling procedure
- 3.3 Variables and their measurement
- 3.4 Factors affecting agricultural modernity
- 3.5 Procedure involved in data collection
- 3.6 Statistical methods used

3.1 Locale of research

The objectives of the study necessitated the selection of Thiruvananthapuram district of Kerala state as the locale of research for the following reasons.

- (1) Varied cropping pattern
- (2) Extremities in the size of holding
- (3) Influence of urban culture
- (4) Influence of the Agricultural College and agricultural research stations of ICAR and SAU

3.2. Sampling procedure

3.2.1 Selection of Krishibhavan

Since the unit area of study pertains to a Krishibhavan the procedure followed for its selection was multi stage random sampling. Accordingly the Neyyatinkara agricultural subdivision was randomly selected from among the three sub divisions of the district; the other two being Nedumangad and Attingal. From among the panchayats of Neyyatinkara sub division, (Number of panchyats = 39) one panchayat namely Perumbazhuthoor was randomly selected for the study. As the administrative unit of the state agricultural department namely Krishibhavan is restricted to each panchayat, Perumbazhutoor Krishibhavan was selected as the unit area of study.

3.2.2 Selection of respondents

The list of farmers under different categories was prepared from the records available at Krishibhavan, DRDA, village office and revenue records. Based on the proportion of the number of farmers in the population, 120 farmers were randomly selected from each category* viz. category I, II & III.

Table 1. Farmer classification and number selected

No.	Farmer's category	Area in hectares	Total number of farmers	Number of Farmers selected
1.	Category - I	< 0.5	2576	60
2.	Category - II	0.5 - 1.0	1131	30
3.	Category - III	> 1.0	868	30

* - This classification is the one as maintained at the Krishibhavans of Kerala State



Fig. 3. Map showing location of study area

Moreover under all the three categories the sample size was conveniently fixed to 60, 30, 30 respectively so as to carry out large sample statistical tests. Thus a total sample of 120 farmers irrespective of their crop cultivation was selected for the study.

3.3 Variables and their measurements

The procedure followed for the measurement of each variable is presented under this caption. One dependent variable, and five independent psychographics (psychological variables) were considered for the study.

Variables and measurements scales utilised

Sl. No.	Variable	Measurement and scoring procedure developed or adopted by
Dependent variable		
	Composite agricultural modernity index	Index to be developed for the study
Independent variables		
1.	Satisfaction	Sinha and Sharma (1980)*
2.	Fatalism	Sinha (1963)
3.	Calculability	Inkeles and Smith (1974) *
4.	Social participation	Selvakumar (1988)
5.	Environmental orientation	Scale developed for the study

* Suitable modifications made

The dependent variable is explained in detail purposively because the main objective of the study is to develop a composite agricultural modernity index and the psychographics of farmers are explained next, to test their influence on the dependent variables.

The selection procedure for psychographics were as follows

3.3.1 Selection of psychographics (Independent variables)

Relevant literature were referred to and social scientists were consulted in order to identify the variables which would possibly influence the agricultural modernity of farmers.

On that basis twenty one variables were identified and a copy of the same were sent/handed over personally to selected judges comprising Professors, Associate Professors and Assistant Professors of Kerala Agricultural University, Tamilnadu Agricultural University and officials of the Kerala State department of Agriculture. [*See Appendix - I Part C*].

The judges were requested to rate the relative importance of the variables in a five point continuum ranging from most relevant to least relevant and to append pertinent variables if any. The mean score for each variable was calculated and those variables with a mean sum of four and above were selected following the procedure adopted by Bhaskaran (1988).

3.3.2 Procedure for developing Composite agricultural modernity index (CAMI)

Through discussions with experts in agricultural universities, state agricultural department officials, and review of literature, a systematic approach was followed to develop CAMI.

3.3.2.1 Selection of components of CAMI

A perusal of relevant literature including the pioneering works of Inkeles and Smith (1966) brought forth five major components affecting individual modernity *viz.* Socio personal component, Socio-psychological behaviour, adoption behaviour, communication behaviour and economic behaviour. Since this taxonomy of behaviour was also applicable to farmers, all these five components were selected to develop CAMI.

These components were then tested by component importance score to identify the relative importance of these components for inclusion in the study. Sixty judges were requested to assess the importance of each component in a five point continuum varying from most important to least important. The mean component importance score was arrived at and taking median three as the cut off point, four components were selected *viz.* socio-psychological behaviour, adoption behaviour, communication behaviour and economic behaviour. [*Refer Appendix - I Part A*].

3.3.2.2 Selection of items

Based on the review of literature and discussion with experts, various items related to the four major components were catalogued. Altogether 18 items were identified under the four components [*Refer Appendix - I Part A*]. These items were then tested by item-importance score to identify the relative importance of these items for inclusion in the study. Sixty judges were requested to assess the importance of each item in a five point continuum namely most important to least important. The responses were quantified with a scoring system of five to one for most important to least important responses. The mean of item importance was arrived at and taking median three as the cut off point, items with scores

above three were selected. Accordingly nine items (hereafter referred to as determinants) were selected; three under socio-psychological behaviour, and two each under adoption behaviour communication behaviour and economic behaviour.

3.3.2.3 Assigning weight for components

Sixty judges were also requested to assign weight for the four components of CAMI based on their relative importance to CAMI. While assigning the weight, the judges were requested to restrict the total scores given to the components to 100. The format of the letter sent to the judges is given in Appendix-I. The agreement among judges in assigning weights was tested by Kendall's coefficient of concordance.

3.3.3 Measurement of determinants

The selected nine items and their measurements are presented here under. [*Refer Appendix - II for the interview schedule*]

Determinants and measurements scales / scores utilised

No.	Items (Determinants)	Measurement and scoring procedure developed or adopted by
1	Education	Scoring procedure developed for the study
2.	Attitude towards scientific cultivation	Arbitrary scale developed for the study
3.	Economic motivation	Nanjaiyan (1985)
4.	Management orientation	Samantha (1977)*
5.	Innovativeness	Sajeev Chandran (1989)
6.	Information source utilisation	Sajeev Chandran (1989)
7.	Information dissemination behaviour	Anitha (1993)
8.	Knowledge	Test developed for the study
9.	Adoption	Jaleel 1992*

* Suitable modifications made

3.3.3.1 Education

Education is conceptualised as the extent of non-formal and formal education an individual possessed. The scoring procedure was as follows

Illiterate	-	0
Can read and write	-	1

One score will be added to every successful completion of formal schooling.

3.3.3.2 Attitude towards scientific cultivation

This is operationally defined as the degree of a farmer's positive or negative feeling towards scientific cultivation.

An arbitrary scale developed for this purpose was used to quantify the attitude score.

The scoring procedure was as follows

Response	SA	A	ND	DA	SDA
Positive statements	5	4	3	2	1
Negative statements	1	2	3	4	5

The attitude score was arrived at by summing up scores of the entire statements.

3.3.3.3 Knowledge of improved farm practices

This variable is operationalised as the extent of understanding of the respondent at the time of interview, as evidenced from his responses

to a set of questions prepared on different aspects of cultivation of important crops grown by him.

A teacher made knowledge test was adopted for the three predominant crops namely paddy, coconut and tapioca which was earlier ascertained through the pilot study. One score was given for every correct answer and the total knowledge score was arrived at by summing up scores obtained for the number of crops cultivated and taking their average.

3.3.3.4 Adoption of improved agricultural practices

This is operationalised as the adoption of improved techniques of cultivation for each of the important crops which the respondent cultivated.

The adoption score followed by Jaleel (1992) was used for the study. The adoption score was worked out using the following formula

$$\frac{\sum_{i=1}^n \frac{e_i}{p_i} \times 100}{n}$$

e_i = Extent of adoption of selected practices

p_i = Potentiality of adoption of each selected practice

n = Total number of selected practices

After calculating the adoption score of each respondent based on the number of crops grown by him, the average of those scores was obtained by dividing the adoption score with the number of crops cultivated.

3.3.3.5 Innovativeness

Innovativeness is operationalised as the degree to which a farmer is relatively earlier in adopting new ideas than the other members of his

social system. Innovativeness was measured using the procedure followed by Sajeev Chandran (1989) with slight modifications.

The scale consisted of five statements and the responses were collected on a three point continuum. The scores were given as

<i>yes</i>	-	2
<i>undecided</i>	-	1
<i>no</i>	-	0

The total score for the five statements was taken as the score for innovativeness.

3.3.3.6 Information Source Utilisation (ISU)

Information Source Utilisation was measured using the scale developed by Sajeev Chandran (1989). Each respondent was asked how often he got information on improved agriculture from each of the listed sources. Responses were given as two, one and zero for *regularly, sometimes and never* respectively.

The response scores were summed up across each item to form the score of use of information source.

3.3.3.7 Information Dissemination Behaviour (IDB)

This is operationally defined as the frequency of information, regarding improved agricultural practices, passed on to others.

The procedure followed by Anitha (1993) was used for the study. The respondents were asked about the frequency of talks in a month on

improved agricultural practices with different categories of persons. The scores given were as follows.

Category	Quite frequently	Frequently	Sometimes	Never
	4	2	1	0

The scores obtained by the respondent for all these categories were added to find the total score for information dissemination behavior.

3.3.3.8 Economic motivation

Economic motivation is defined as an individual's orientation towards achievement of maximum economic ends such as profit maximisation.

The scale developed by Nanjaiyan (1985) was used for the study.

Responses	SA	A	ND	DA	SDA
Positive statements	5	4	3	2	1
Negative statements	1	2	3	4	5

The economic motivation score was obtained by adding the responses of the respondents.

3.3.3.9 Management orientation

This is operationalised as the degree to which a farmer is oriented towards scientific farm management comprising planning, production and marketing functions of farm enterprises.

Management orientation was measured using the scale developed by Samantha (1977). The scale consisted of 18 statements, six statements each for planning, production and marketing orientation. The respondents were asked to state their agreement or disagreement to each of the statements and scores of one and zero were assigned respectively considering whether the statements were positive or negative. The management orientation score was obtained by summation of the scores for all the 18 statements.

3.3.4 Calculation of component score

The scores of all items under each component were summed up so as to arrive at the score of the particular component.

3.3.5 Computation of weight

The scores assigned by judges for each component restricted to a total of 100 were summed up and the mean calculated. This formed the weight of each component.

3.3.6 Computation of CAMI

CAMI is actually the weighted average of the scores multiplied by 100 with the weight being the sum of the weights given by the judges for the components. The computation of CAMI is presented under RESULTS.

3.3.7 Measurement of psychographics

3.3.7.1 Satisfaction

Satisfaction is operationalised as contentment of the respondents in their basic needs, family needs as well as social needs.

Satisfaction was measured by using the scale developed by Sinha and Sharma (1980) with slight modifications.

There were eight statements in the scale and scoring was done as follows.

Responses	Least satisfied	Less satisfied	Satisfied	More satisfied	Most satisfied
Statements	1	2	3	4	5

The satisfaction score was arrived at by summing up all the responses.

3.3.7.2 Fatalism

This is operationalised as a belief held by a farmer that human situations and acts are predetermined by some supernatural power and can never be influenced by individual volition (or) by acts of any one else.

The scale developed by Sinha (1963) was used for the study which consisted of three statements and the respondents were requested to state their agreement on a three point continuum. The scores for the responses of each statement in terms of *agree*, *undecided* and *disagree* were three, two and one respectively.

The scores for each response were added to obtain the total score for fatalism.

3.3.7.3 Calculability

This is operationalised as a state in which the modern farmer has more confidence that his life is calculable and that individuals and institutions around him can be relied upon, to meet his obligations.

The scale used by Inkeles and Smith (1974) with slight modification was used for the study. For the first three statements the scores were two, one and zero for *always*, *sometimes* and *never*. The fourth statement had three multiple choice answers which were given the scores of two, one and zero.

The individual responses were summed up to form the calculability score.

3.3.7.4 Social participation

This is operationalised as the degree of involvement of the respondents in formal and informal organisations as members or office bearers and their extent of participation in organisational activities.

The scale used by Selvakumar (1988) was used for the study.

The social participation score of an individual respondent was calculated by assigning scores of two and one respectively for office bearer and member, irrespective of their past or present membership. Further, based on their participation, like planning activity and organising activity, one score each was assigned. This was checked in a continuum namely "*regularly*", "*somewhat regularly*", "*occasionally*", "*rarely*" and "*never*", with a score distribution of four, three, two, one and zero. The total score was calculated by summing up the scores of membership and activities and was multiplied by the score obtained in the continuum.

3.3.7.5 Environmental orientation

This is operationalised as the degree to which a farmer was concerned about his environment.

The arbitrary scale constructed, consisted of six statements, and the respondents were asked to state their agreement or disagreement to each of the statements and scores of one and zero were assigned for *agree* and *disagree* respectively. The responses were summed up to obtain the environmental orientation score.

3.4 Factors affecting agricultural modernity

Factors are elements which could possibly influence or affect CAMI.

Altogether 13 factors were identified in consultation with experts of agricultural universities and departments, progressive farmers and perusal of literature. The list of factors were sent to sixty judges for validating their relevancy [See Appendix-I Part B]. Based on the midpoint criterion score of three and above, seven factors were finally selected for the study. Their operationalization and measurement are given.

Factors and measurement scales / scores utilised

No	Factors	Measurement and scoring procedures developed or adopted by
1	Farm size	Developed for the study
2	Farming experience	Jaleel (1992)
3	Number of enterprises	Developed for the study
4.	Credit behaviour	Beal and Sibley (1967)*
5.	Cosmopoliteness	Segar (1979)
6.	Training attended	Developed for the study
7.	Risk orientation	Supe (1969)

* Suitable modifications made

3.4.1 Farm size

Farm size was operationalised as the area under cultivation of the respondent in acres during the previous year of survey. The farm size score was considered based on the extent of area of land in acres *per se* irrespective of the type of land.

3.4.2 Farming Experience

This was operationalised the number of years, the respondent has been practising farming enterprise. The scoring procedure adopted was one score for each completed year of farming experience as followed by Jaleel (1992).

3.4.3 Number of enterprises

This was operationalised as the number of enterprises owned or managed by the respondent. A score was assigned for each enterprise. The total score was arrived at by summing up the individual enterprise scores.

3.4.4 Credit behaviour

This was operationalised as the farmer's behaviour towards credit source, use and its repayment. The procedure followed by Beal and Sibley (1967) with suitable modification was used for the study. The score was assigned based on dichotomous distribution with scores one for "yes" and zero for "no".

The total score was obtained by summing up the responses.

3.4.5 Cosmopolitaness

This was operationalised as the frequency and purpose of visits by a farmer to places outside his village. The scoring procedure adopted by Segar (1979) was used in the study.

The scoring distribution was by assigning one score for positive response for their visit to towns and for agricultural purpose and scores three, two and one were assigned for the frequency of visit respectively for *often*, *occasional* and *rarely*.

The summed up score of visit to towns and purpose of visit was multiplied by the frequency of visit score so as to arrive at the total score of cosmopolitaness.

3.4.6 Training attended

This was operationalised as the number of formal and non formal types of training attended by the respondent. Training score was obtained by assigning one score for each training attended. An additional score was assigned for each repeated attendance.

3.4.7 Risk orientation

The degree to which a farmer is oriented towards encountering risk and uncertainty in adopting new ideas or practices in agriculture was operationalised as risk orientation for the purpose of this study.

The scale and scoring procedure adopted by Supe (1969) was followed for the study which was as follows.

Purpose	SA	A	ND	DA	SDA
Positive statements	7	5	4	3	1
Negative statements	1	3	4	5	7

The scores obtained for the responses were summed up to obtain the individual respondent's risk orientation score.

3.5 Procedure involved in data collection

The data were collected with the help of an interview schedule incorporating all the items on which information was required. The interview schedule was presented in a logical sequence with necessary modifications based on the pilot study conducted.

The data were collected, coded and analysed with the help of a computer available in the College of Agriculture, Vellayani.

3.6 Statistical methods used

The following non-parametric and parametric statistical tests were used in this study in accordance with the nature of data and relevant information required.

Kendall's co-efficient of concordance test was used to find out the agreement among judges in assessing the components and items under CAMI.

Parametric tests like simple correlation and multiple regression were carried out to find out the relationship between the determinants and

CAMI, psychographic variables and CAMI, and factors affecting agricultural modernity and CAMI.

Adjusted R^2 was also worked out by using the formula

$$\overline{R^2} = 1 - \frac{N}{N - K} (1 - R^2)$$

Apart from this, simple percentage analysis was also done to explain the variables.

RESULTS

The Blessed Lord said –

“He who performs his bounden duty without depending on the results is a yogi”

– Bhagawath Geetha. Chapter VI

RESULTS

This chapter highlights the findings of the present investigation. They are presented under the following sections in the light of the objectives set forth.

- 4.1 Development of composite agricultural modernity index (CAMI)
- 4.2 Extent of agricultural modernity of farmers.
- 4.3 Determinants of agricultural modernity and their relationship with CAMI.
- 4.4 Relationship between CAMI and psychographics of farmers.
- 4.5 Relationship between CAMI and factors influencing agricultural modernity.

4.1 Development of composite agricultural modernity index (CAMI)

4.1.1 Components and items (determinants) of agricultural modernity

Table 2. Components of agricultural modernity and their weights

No.	Components	Weight
1.	Sociopsychological behaviour	22.75
2.	Adoption behaviour	28.75
3.	Communication behaviour	23.75
4.	Economic behaviour	24.75

The weight obtained for each component of agricultural modernity is depicted in Table 2. Adoption behaviour received maximum weight followed by economic behaviour and communication behaviour. Of the four components sociopsychological behaviour received the least weight.

It is thus observed that among the four components adoption behaviour received maximum weight.

Table 3. Determinants (items) proposed and selected

No.	Components	Number of items proposed	Number of items selected
1.	Socio psychological behaviour	5	3
2.	Adoption behaviour	4	2
3.	Communication behaviour	3	2
4.	Economic behaviour	6	2

Of the 18 items proposed across the four components 50 per cent of the total number of items were eliminated on the basis of Kendall's coefficient of concordance test. The above Table 3, shows the number of items selected under each component.

4.1.2 Computation of the component score

The scores obtained by the respondents for all items (based on the scoring procedure developed for each item) under each component were summed up and this was computed using the formula

$$S_i = \sum_{j=1}^{n_i} x_{ij} ; 1 \leq j \leq n_i = \text{number of items under the } i^{\text{th}} \text{ component.}$$

$$; 1 \leq i \leq N = \text{number of components}$$

x_{ij} = item score a respondent for the j^{th} item
under i^{th} component.

S_i was calculated separately for each component namely sociopsychological behaviour, adoption behavior, communication behaviour and economic behaviour.

4.1.3 Computation of weight

The score assigned by the judges for each component, restricted to a total of 100, was computed as follows.

$$W_i = \frac{1}{k} \sum_{j=1}^k p_{ij} ; 1 \leq i \leq 4$$

$$; 1 \leq j \leq k = \text{number of judges}$$

p_{ij} = weight given by j^{th} judge for i^{th} component.

W_i was calculated separately for the four components namely sociopsychological behaviour, adoption behaviour, communication behaviour and economic behaviour.

4.1.4 Computation of CAMI

By using the component score S_i and the weight W_i for all the four components, CAMI was computed as follows.

$$CAMI_r = \sum_{i=1}^4 \frac{S_i W_i}{\Sigma W_i} \times 100$$

In the present study, $\Sigma W_i = 100$

Thus the computation becomes,

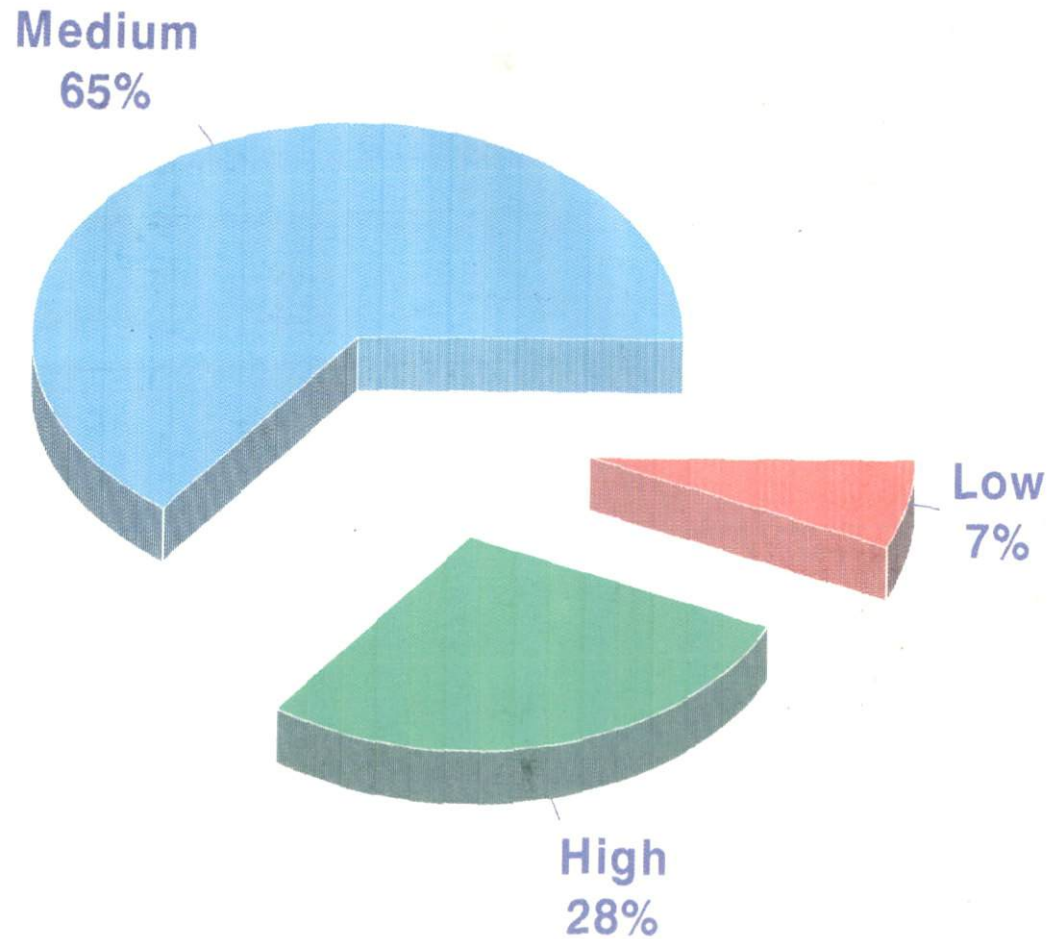
$$CAMI_r = \sum_{i=1}^4 S_i W_i$$

4.2. Extent of agricultural modernity of farmers

Table 4. Distribution of respondents according to their modernity range

CAMI Range	Number of farmers	Percentage	Level
0-25	8	6.7	Low
25-50	78	65.0	Medium
50-75	34	28.3	High
75-100	0	0	Very high

That, none of the farmers came under the very high modernity level is explicit from Table 4. It also reveals that while two third of the respondents belonged to the medium modernity level, one fourth belonged to the high level.



**Fig. 4. Extent of Agricultural modernity of farmers
(shown as high, medium and low levels)**

Thus it is inferred that two third of the respondents belonged to the medium modernity level.

Table 5. Category wise distribution of farmers according to their modernity range

CAMI Range	Category I (< 0.5 ha)		Category II (0.5 - 1 ha)		Category III (> 1 ha)		Level
	No	Per cent	No	Per cent	No	Per cent	
	0-25	5	8.3	3	10	0	
25-50	38	63.3	20	66.7	20	66.7	Medium
50-75	17	28.4	7	23.3	10	33.3	High
75-100	0	0	0	0	0	0	Very high

A cursory glance at Table 5 reveals that two third of the categories of farmers I, II and III belonged to the medium modernity level and none of the categories of farmers came under the very high modernity level.

More than one fourth of the farmers under category I and less than one fourth under category II belonged to the high modernity level. However one third of the farmers under category III belonged to the high modernity level.

All three categories of farmers belonging to the low modernity level were comparatively negligible. It is interesting to note that none of the farmers under category III belonged to the low modernity level.

Hence it is concluded that none of the categories of farmers came under the very high modernity level. Two third of the farmers under category I, II and III belonged to the medium modernity level and nearly one fourth belonged to the high modernity level. None of the farmers under category III belonged to the low modernity level.

4.3 Determinants of agricultural modernity and their relationship with CAMI

Table 6. Correlation coefficients for determinants of agricultural modernity with CAMI

No.	Determinants/Items	r-value
a. Socio psychological behaviour		
1.	Education	0.5071**
2.	Attitude towards scientific cultivation	0.9031**
3.	Knowledge	0.9157**
b. Adoption behaviour		
4.	Adoption	0.9481**
5.	Innovativeness	0.7151**
c. Communication behaviour		
6.	Information source utilisation	0.8432**
7.	Information dissemination behaviour	0.7567**
d. Economic behaviour		
8.	Economic motivation	0.8467*
9.	Management orientation	0.8410*

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

An examination of Table 6 brings home the relationship between the determinants of agricultural modernity and CAMI. All determinants except economic motivation and management orientation had positive and significant relationship with CAMI. The determinants, economic motivation and management orientation had positive and significant relationship with CAMI at five per cent level of probability.

It is therefore ascertained that CAMI is a function of the nine determinants *viz.* education, attitude towards scientific cultivation, knowledge, adoption, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation.

Hence it is concluded that an increase in the nine determinants *viz.*, education, attitude towards scientific cultivation, knowledge, adoption, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation would intensify CAMI.

It could be observed from Table 7 that all the nine determinants namely education, attitude towards scientific cultivation, knowledge, adoption, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation could much sufficiently explain CAMI.

Table 7. Results of multiple regression analysis of CAMI on determinants of agricultural modernity

No.	Determinants	β coefficient	't' value	F value
a. Sociopsychological behaviour				
1.	Education	0.2275	432.737**	61.5968**
2.	Attitude towards scientific cultivation	0.2275	362.909**	
3.	Knowledge	0.2277	77.453**	
b. Adoption behaviour				
4.	Adoption	0.2875	1014.698**	
5.	Innovativeness	0.2875	321.77**	
c. Communication behaviour				
6.	Information source utilisation	0.2375	619.337**	
7.	Information dissemination behaviour	0.2375	405.966**	
d. Economic behaviour				
8.	Economic motivation	0.2475	407.668**	
9.	Management orientation	0.2475	319.085**	

** Significant at 0.01 level of probability

The 't' values for all the determinants were significant at one percent level of probability.

The prediction equation fitted is

$$Y = 0.0001 + 0.2275^{**} x_1 + 0.2275^{**} x_2 + 0.2277^{**} x_3 + 0.2375^{**} x_4 + 0.2875^{**} x_5 + 0.2375^{**} x_6 + 0.2375^{**} x_7 + 0.2475^{**} x_8 + 0.2475^{**} x_9$$

Adjusted $R^2 = 0.998$



It is thus deduced that an increase in all the nine determinants would enhance the CAMI significantly.

Hence it is inferred that for every five unit increase in each of the determinants *ceteris paribus viz.* education, attitude towards scientific cultivation, knowledge, adoption, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation, there would be one unit increase in CAMI.

4.4 Relationship between CAMI and psychographics of farmers

It is seen from Table 8 that half of the respondents had high levels of satisfaction and calculability. Nearly two third of the respondents were less fatalistic and less environmentally oriented. More than half of the sample had low levels of social participation.

Table 8. Distribution of respondents according to their psychographics

Psychographics	Mean value	Level	Number	Per cent
Satisfaction	23	≤	59	49.2
			61	50.8
Fatalism	3	≤	71	59.2
			49	40.8
Calculability	6	≤	60	50
			60	50
Social participation	9	≤	63	52.5
			57	47.5
Environmental orientation	5	≤	77	64.2
			43	35.8

Hence it concluded that almost half of the respondents had high levels of calculability and satisfaction but low levels of social participation.

Nearly two third of the respondents were less environmentally oriented and less fatalistic.

Table 9. Correlation coefficients for psychographics with CAMI

No	Psychographics	r-Value
1.	Satisfaction	0.7216**
2.	Fatalism	-0.5096**
3.	Calculability	0.6014**
4.	Social participation	0.7113**
5.	Environmental orientation	0.5094**

** Significant at 0.01 level of probability

Table 9 bringing out the relationship between psychographics and CAMI illustrates that all the psychographic variables had positive and significant relationship with CAMI at one per cent level of probability except fatalism which had negative relationship.

It is therefore inferred that CAMI is a function of the psychographics *viz.*, satisfaction, fatalism, calculability, social participation and environmental orientation.

Hence it is proved that increase in psychographics *viz.*, satisfaction, calculability, social participation and environmental orientation would enhance CAMI and a decrease in fatalism would heighten CAMI.

Table 10. Results of multiple regression analysis of CAMI on psychographics

No.	Psychographics	β coefficient	't' value	F value
1.	Satisfaction	0.6862	5.676**	
2.	Fatalism	-1.0992	3.984**	71.3719**
3.	Calculability	1.5386	4.192**	
4.	Social participation	0.4596	3.961**	
5.	Enviromental orientation	2.1063	3.356**	

** - Significant at 0.01 level of probability.

A perusal of Table 10 reveals that all the five psychographic variables together contributed about 76 per cent of the variation in CAMI (F value = 71.37 significant at 0.01 level of probability).

The 't' values for all the five variables were significant at one percent level of probability. The prediction equation fitted is

$$y = 7.2066 + 0.6862^{**} x_1 - 1.0992^{**} x_2 + 1.5388^{**} x_3 + 0.4596^{**} x_4 + 2.1063^{**} x_5$$

Adjusted R² = 0.749.

It is deduced that an increase in satisfaction, calculability, social participation and environmental orientation would increase CAMI and a decrease in fatalism would increase CAMI.

Hence it is concluded that for every three unit increase in satisfaction, there would be two unit increase in CAMI *ceteris paribus*. For

every one unit decrease in fatalism *ceteris paribus* there would be a unit increase in CAMI. For every two unit increase each in calculability and social participation *ceteris paribus* there would be three unit increase and one unit increase in CAMI respectively. For every one unit increase in environmental orientation there would be two units increase in CAMI *ceteris paribus*.

4.5 Relationship between CAMI and factors influencing agricultural modernity

Table 11. Correlation - Coefficients for factors affecting agricultural modernity with CAMI

No	Factors	r-value
1.	Farm size	0.2333*
2.	Farming experience	-0.2392**
3.	Number of enterprises	0.4246**
4.	Credit behaviour	0.3380**
5.	Cosmopolitaness	0.5166**
6.	Training	0.4985**
7.	Risk orientation	0.7476**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

This Table 11 displays the relationship between the CAMI and the factors influencing agricultural modernity. It is understood that all the factors were influencing CAMI positively and significantly except farming experience which was influencing CAMI negatively. Again, all

the factors were significantly influencing at one per cent level of probability excepting farm size which was found influencing at five per cent level of probability. Hence it is inferred that the CAMI is a function of all the factors *viz.*, farm size, farming experience, number of enterprises, credit behaviour, cosmopolitaness, training and risk orientation.

Thus an increase in the factors *viz.*, - farm size, number of enterprises, credit behaviour, cosmopolitaness, training and risk orientation would increase CAMI and a decrease in experience in farming would also increase CAMI.

Table 12. Results of multiple regression analysis of CAMI on factors affecting agricultural modernity

No.	Psychographics	β coefficient	't' value	F value
1.	Farm size	0.2732	1.023	
2.	Farming experience	-0.0438	0.918	
3.	Number of enterprises	0.6367	0.677	30.8550**
4.	Credit behaviour	0.5850	0.647	
5.	Cosmopolitaness	1.2091	2.115*	
6.	Training	1.4033	2.879**	
7.	Risk orientation	0.8397	8.713**	

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

As is evident from Table 12, it may be stated that all the seven factors together explained a significant amount of variation (65.85%) in

CAMI. The 't' values for two variables *viz.*, training and risk orientation were significant one per cent level of probability, and that for cosmopolitanism was significant at five per cent level of probability. The test indicated that these three factors explained much variation in CAMI.

The fitted equation is

$$y = 19.8651 + 0.2732 x_1 - 0.0438 x_2 + 0.6367 x_3 + 0.5850 x_4 + 1.2091^* x_5 + 1.4033^{**} x_6 + 8.8397^{**} x_7$$

$$\text{Adjusted } R^2 = 0.639$$

Hence it is inferred that an increase in cosmopolitanism, training and risk orientation would increase CAMI.

Hence for every one unit increase in cosmopolitanism, training and risk orientation there would be one unit increase in CAMI *ceteris paribus*.

DISCUSSION

"Do not become the archivists of facts. Try to penetrate to the secret of their occurrence, persistently search for the laws which govern them".

— Pavlov's bequest to the academic youths of Russia, Feb. 27, 1936

DISCUSSION

This chapter includes the discussion part of the study. This is presented under the following heads.

- 5.1 Development of composite agricultural modernity index (CAMI)
- 5.2 Extent of agricultural modernity of farmers.
- 5.3 Determinants of agricultural modernity and their relationship with CAMI.
- 5.4 Relationship between CAMI and psychographics of farmers.
- 5.5 Relationship between CAMI and factors influencing agricultural modernity.

5.1 Development of composite agricultural modernity index (CAMI)

Table 2 brings forth the following details. The scores assigned by the judges to the various components were almost equal which explicitly illustrates the equal importance of the four components in determining CAMI. However among the components, adoption received maximum weight probably due to the conviction that adoption was the prime cause of modernity. Not surprisingly next came economic behaviour weight, since human beings have essentially in them an economic motive and an urge

for financial stabilisation. Communication behaviour was ranked third, which stressed the importance of utilization and dissemination of information and the role communication played in diffusing innovations. The salience of socio psychological behaviour though ranked last cannot be undermined as it encompasses the innate characteristics of human beings.

Regarding items as evident from Table 3 all except socio-psychological component had two items each. Socio-psychological component had three items because as mentioned earlier the socio-psychological characteristics of an individual becomes the foundation upon which the seeds of other behavioural components are sown.

5.2 Extent of agricultural modernity of farmers

Table 4 brings to light the fact that two third of the respondents belonged to the medium modernity level. Farmers having higher levels of adoption of improved practices, may for instance show low information dissemination behaviour. Likewise the interplay of the nine determinants of modernity will have varying effects on farmers' modernity. This could be the reason that has brought down two third of the respondents to the medium level of modernity. Only those farmers who have high levels in all the nine determinants can attain high or very high modernity levels. Such instances are also observed from the table.

Category-wise distribution as observed from Table 5 has also failed to discriminate the modernity levels among farmer categories. All the categories had majority of the farmers in the medium modernity level. The most remarkable outcome of this study however is the fact that size of holding has a not so high influence on farmers modernity. This is

particularly relevant to a state like Kerala, where the average holding size compared to that of India is small. Nonetheless, the absence of even a single farmer under category III (who have higher holding size) in the low modernity level is also a matter not to be over looked.

5.3 Determinants of agricultural modernity and their relationship with CAMI

Table 6 reveals that, all the nine determinants (items) were positively and significantly influencing CAMI which indicated that, higher the determinants, higher would be the level of CAMI. Moreover it proved that the selected items for developing CAMI were indeed appropriate. The remarkably high 'r' values stressed their importance and indispensability as determinants of CAMI.

Plausible explanation for the inclusion of the nine determinants are given below.

It is universally accepted that education is a determinant which modifies the behavioural components of knowledge, skill and attitude of farmers. Thus education is a powerful predictor of CAMI meaning; higher the education greater will be the changes that result.

Attitude towards scientific cultivation is one of the main behavioural component which clarifies and decides on the acceptance and rejection of an innovation. Attitude is nothing but, a mental disposition formed by knowledge, experience and perception of the individual which no doubt contributes profusely to CAMI.

Knowledge is the basic and prime input for any behaviour modification. It acts as a medium to absorb and assimilate different patterns of behaviour. An individual is not prone to change without knowledge and there is no substitute for true knowledge.

Behavioural modification of an individual is made an observable evidence by the continued adoption of a new technology. Adoption is the desired end product of a development process which strengthens the individuals' accountability in the process. This could be the reason for assigning adoption the highest priority among the determinants of CAMI.

Innovativeness, it has been argued, has contributed to the change in farming conditions and still continue to raise the performance level of farmers. Thus a modern farmer who is innovative is willing to change his beliefs, attitudes and ways of acting in response to new challenges and development.

Development *sans* well knit communication machinery would be incomplete if not illusory. The information source is a vital component in a communication process. Given the fact that the fidelity of communication relies much on the credibility of the source it would be a natural out come that CAMI is positively and significantly correlated with the **information source utilisation**.

For modernity to grow and develop there should be a continuous flow of communication. Reception, and processing of message within the individual alone will neither give clarity nor utility to the information. Proper distribution of information through sharing and discussion with fellow farmers alone would foster agriculture development. This could explain **information dissemination behaviour's** positive relationship with CAMI.

Management orientation is one determinant of modernity which grooms and refines individuals in areas of planning, production and marketing. Worthiness of a practice, its relative advantage and trialability is made known to the farmer only by proper orientation towards management.

An entity related to the satisfaction of a farmer's economic needs would attract any economically motivated farmer. As modernity by and large satisfies his economic ambitions, positive correlation of CAMI with economic motivation seems to be a direct result.

5.4 Relationship between CAMI and psychographics of farmers

Regarding the psychographic characteristics of farmers, all the variables were found having positive and significant relationship with CAMI, except fatalism which showed negative significance. Arguments to the results of Table 9 are discussed.

More the **satisfaction** more would be the agricultural modernity. If an individual is satisfied with his basic needs, family needs and social needs he can devote more attention towards modern agricultural practices. This could be the reason for its positive influence on CAMI. The result supports the findings of Couvillion (1992) and Saunders (1969).

Fatalism by virtue of its hostility to innovation is clearly antithetical to the development of agricultural modernity. Farmers who go in for the latest technology would secure higher modernity scores that would give negative relationship of CAMI with fatalism, which in essence glorifies past beliefs and practices as immutable.

It is seen that, more the calculability more would be the modernity. Thus a farmer who believes that individuals and institutions can be relied upon to meet his obligations, is more confident in his work and is quite capable of dealing with uncertainties which crop up often in agriculture. Hence the positive influence of calculability on modernity which supports the findings of Kumar (1972).

Increase in social participation enhances agricultural modernity of farmers. As farmers participate in institutions and associations involved in agricultural development, they are kept abreast with upto date information and latest technical know how. Thus increased social participation will definitely improve CAMI.

Environmental orientation is found favourably influencing agricultural modernity. As the oft quoted aphorism goes, there is enough in nature for man's need but not enough for man's greed, the need of the hour is to internalize environmental concerns in modern agriculture, so that progress and conservation go hand in hand. Thus farmers who are more concerned about the environment are the ones who are truly modern.

5.5 Relationship between CAMI and factors influencing agricultural modernity

Save farming experience, all the six factors were positively and significantly influencing CAMI. Possible reasons to the revelations of Table 11 are presented.

Increase in farm size brings about an increase in CAMI. While farmers with small farms will have limited resources for adopting modern

techniques, farmers with large holdings would adopt more advanced and cost effective technologies to make their enterprise more remunerative which in turn influence CAMI positively. This supports the findings of Raj kumar (1992).

Interestingly **farming experience** is found to have negative significance with CAMI. New entrants in the agricultural enterprise would be more ready to accept latest technology and will have more scientific urge to adopt them. Most of the old farmers might have had innumerable distresses due to risk factors and other natural calamities which would prevent adoption of modern techniques in agriculture.

As regard the **number of enterprises**, more the number of enterprises, greater would be the agricultural modernity. Agriculture as a single enterprise is subject to risk and uncertainties and its commodities have highly fluctuating prices in the market. So, to avoid risk and to minimise loss, the farmers would have chosen diversified enterprise combinations. Hence the result of positive significance with CAMI which supports the findings of Raj kumar (1992).

Not surprisingly, **cosmopolitanness** of farmers was positively influencing CAMI. Farmers with more contact with external situations gain more experience from other progressive farmers and such inquisitiveness to seek more information, would no doubt enhance modernity.

Training is found to influence CAMI positively because training imparts knowledge and skill to farmers and promote favourable change in attitude of farmers towards modernity. This modified behaviour of

farmers as a result of training would possibly increase their agricultural modernity.

Risk orientation is the next factor which was also positively influencing CAMI. As explained elsewhere agriculture is more often entangled with risk and only those farmers who are venturesome and more risk oriented can go in for adoption of modern technology and come up with promising results. This contradicts the findings of Raj kumar (1992) who reported nonsignificant relationship of risk with agricultural modernisation.

Credit behaviour was found positively influencing CAMI. Utilisation of credit through institutional sources and prompt repayment of credit are characteristic of farmers whose convictions towards the institutional realm are more ethical.

SUMMARY

*"The mind is its own place, and in itself
can make a Heav'n of Hell, a Hell of Heav'n"*

— Milton, *Paradise Lost*

SUMMARY

This study was undertaken based on the premise that any attempt to design, a suitable extension strategy for modernising agriculture requires a thorough understanding of the individual modernity of a farmer. The objectives of the study were.

1. To develop a composite agricultural modernity index
2. To assess the extent of agricultural modernity of farmers
3. To explore the relationship between the psychographics of farmers and their modernity.
4. To analyse the factors influencing agricultural modernity

The study area was the Perumbazhuthoor Panchayat in the Neyyattinkara sub division of Thiruvananthapuram district of Kerala, selected by the multistage random sampling method. As the administrative unit of the state agricultural department namely Krishibhavan is restricted to each panchayat, the Perumbazhuthoor Krishibhavan was selected as the unit area of study.

A sample of 120 farmers was randomly selected irrespective of their crop cultivation. Based on the proportion of the number of farmers in the population with regard to the holding size, sixty farmers from Category I, thirty farmers from Category II and thirty farmers from Category III were selected.

The data were collected with the help of a pre tested interview schedule. The dependent variable of the study was the composite agricultural modernity index (CAMI) and the independent psychographics were satisfaction, fatalism, calculability, social participation and environmental orientation.

Factors affecting agricultural modernity were also considered for the study and they were farm size, farming experience, number of enterprises, credit behaviour, cosmopolitaness, training and risk orientation.

Statistical tests such as percentage analysis, simple correlation and multiple regression were used for the analysis of the data.

The main findings of the study were as follows.

1. Among the four components *viz.*, socio-psychological behaviour, adoption behaviour, communication behaviour and economic behaviour, adoption behaviour received maximum weight.
2. Nine items (determinants) were selected out of 18 items proposed across the four components. The number of determinants were three under socio-psychological behaviour and two each under adoption, communication and economic behaviour
3. A composite agricultural modernity index was developed with the nine determinants *viz.*, education, attitude towards scientific cultivation, knowledge, adoption of improved practices, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation



Fig. 5. Empirical framework

The factors and psychographics are given in colour gradients.
 Greater the correlation value, deeper the colour.
 Farming experience without colour is negatively correlated.

4. Increase in the nine determinants *viz.*, education, attitude towards scientific cultivation, knowledge, adoption of improved agricultural practices, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation enhanced CAMI.
5. For every five unit increase in each of the determinants namely education, attitude towards scientific agriculture, knowledge, adoption of improved agricultural practices innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation, there was one unit increase in CAMI.
6. Nearly two third of the total respondents belonged to the medium modernity level.
7. None of the categories of farmers came under very high modernity level. Two third of the farmers under Category I, II and III belonged to the medium modernity level, and nearly one fourth belonged to the high modernity level. None of the farmers under Category III came under the low modernity level.
8. Almost half of the respondents had high levels of satisfaction and calculability but had low levels of social participation. Nearly two third of the farmers were less environmentally oriented and less fatalistic.
9. Increase in the psychographics, *viz.*, satisfaction, calculability, social participation and environmental orientation enhanced CAMI and a decrease in fatalism enhanced CAMI.

10. For every three unit increase in satisfaction, there was two unit increase in CAMI *ceteris paribus*. For every one unit decrease in fatalism *ceteris paribus*, there would be one unit increase in CAMI. For every two units increase each in calculability and social participation *ceteris paribus*, there were three units increase and one unit increase in CAMI respectively. For every one unit increase in environmental orientation, there were two units increase in CAMI *ceteris paribus*.
11. Increase in the factors *viz.*, farm size, number of enterprises, credit behaviour, cosmopolitaness, training and risk orientation increased CAMI and a decrease in farming experience increased the CAMI.
12. For every one unit increase each in cosmopolitaness, training and risk orientation there was one unit increase in CAMI *ceteris paribus*.

Suggestions for future research

An interaction study between the individual farmer and social variables can be taken up.

A detailed study incorporating other modernity indicators in future will pave way for strengthening agricultural modernity research.

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APPENDICES

APPENDIX - I

SCHEDULE FOR JUDGES OPINION

From

Dr. S. Bhaskaran,
Associate Professor,
Department of Extension,
College of Agriculture,
Vellayani.

Dated: 21.07.1994

Dear Sir/Madam,

I am pleased to inform that Mr. Sreevalsan.J.Menon has taken up a research study titled **"Taxonomical Analysis of Agricultural Modernity of Farmers"** with the following objectives.

1. To develop a composite agricultural modernity index.
2. To assess the extent of agricultural modernity of farmers.
3. To find the relationship between the psychographics of farmers and their modernity.
4. To analyse the factors influencing agricultural modernity.

He attempts to develop a modernity index for which he has collected a list of components and items (under each component). Kindly rate them critically in the continuum provided and return the same in the self-addressed stamped envelope enclosed. This questionnaire has 3 parts of which Part A comprises the components and their related items and Part B a list of factors influencing modernity of farmers and Part C the psychographics of farmers.

P A R T - A

The following are the list of components identified for developing the composite agricultural modernity index. Kindly rate them in a continuum ranging from most important to least important.

Socio personal component
Socio psychological component
Adoption component
Communication Components
Economic component

Most important	More important	Important	Less important	Least important

Kindly also assign scores to each component according to its relative importance in deciding the agricultural modernity of farmers. Kindly make sure that the total score does not exceed 100. If any addition of new component is felt, please add them to the list and assign scores to that component also restricting the total to 100.

1. Adoption Behaviour
2. Economic Behaviour
3. Communication Behaviour
4. Socio-psychological Behaviour

Total	100
-------	-----

The following are the list of items identified under such component in developing the index. Kindly rate them in a continuum ranging from most important to least important. Please feel free to add new items to the list.

	Most important	More important	Important	Less important	Least important
I. Socio-psychological Behaviour					
a) Knowledge					
b) Skill					
c) Attitude towards Scientific Cultivation					
d) Education					
e) Training undergone					
f) Others if any					
II. Adoption Behaviour					
a) Symbolic adoption					
b) Actual Adoption					
c) Innovativeness					
d) Conviction of technology					
e) Others if any					
III. Communication Behaviour					
a) Information dissemination behaviour					
b) Information source utilization					
c) Credibility of source					
d) Others if any					
IV. Economic Behaviour					
a) Economic motivation					
b) Value orientation					
c) Management orientation					
d) Market orientation					
e) Farm mechanization					
f) Planning					
g) Others if any					

PART - B

The following is the list of factors identified which influence the modernity of farmers. Kindly rate them in a continuum ranging from most important to least important. You are free to add any other factor which is relevant.

1. Family background
2. Family size
3. Rural/urban residence
4. Farm size
5. Farming experience
6. Number of enterprises
7. Risk orientation
8. Training attended
9. Productivity of land
10. Cosmpolitieness
11. Saving habit
12. Credit behaviour
13. Farm Machanisation

Most important	More important	Important	Less important	Least important

PART - C

Following is the list of Psychographics (Psychological variables) of farmers which could effect agricultural modernity of farmers. Kindly rate them in a continuum ranging from most important to least important.

1. Level of aspiration
2. Empathy
3. Present-future orientation
4. Faith in distributive justice
5. Satisfaction
6. Achievement motivation
7. Adaptability
8. Social participation
9. Environmental orientation
10. Propensity for change
11. Individualism
12. Dogmatism
13. Fatalism
14. Deferred gratification
15. Self reliance
16. Calculability
17. Ideological leaning
18. Need achievement
19. change orientation
20. Overall modernity
21. Rationality in decision making

Most important	More important	Important	Less important	Least important

Kindly return your ratings as early as possible
Thanking you for your kind co-operation

Yours sincerely

Sd/-

Dr. S.Bhaskaran

APPENDIX - II
INTERVIEW SCHEDULE

1. Name of the Farmer:
2. Age in completed years:
3. Educational Status:
4. Caste: FC/BC/SC
5. Occupation: Primary -
Secondary -
6. Farm size (in cents): Garden land -
Wet land -
7. Farming experience: years
8. Number of enterprises: Agriculture .. :
Livestock :
Poultry :
Fisheries :
9. Credit behaviour
 - a) Did you use credit in the last two years for crop production. : Yes/No
 - b) You should take credit from institutional source than from money lenders : Yes/No
 - c) Have you been prompt in repayment : Yes/No
10. Cosmopolitaness:
 - a) Have you ever visited neighbouring towns/cities : Yes/No
 - b) If yes, how often do you visit : Often/occasional/rarely
 - c) Purpose of visit : Agriculture/Non-agriculture
11. Training attended:

Name of the training programme	Organisation which imparted	Duration training	No. of times attended	Remarks

12. Attitude towards Scientific cultivation:

SA A UD DA SDA

- 1) Scientific cultivation spoils structure and fertility status of soil.
- 2) Only scientific agriculture can bring prosperity to our nation.
- 3) It will be possible to solve our food problem through HYV cultivation.
- 4) It is very difficult to cultivate HYV by an ordinary farmer.
- 5) Chemical fertilizers and plant protection chemicals are important methods to increase production.
- 6) The way a farmer's forefathers farmed is still the best way to farm.

13. Economic Motivation

- 1) Community respects rich farmers more than poor farmers.
- 2) Prestige is more important than profit in judging success of farm.
- 3) Money alone does not give satisfaction in a farmer's life.
- 4) A farmers should always aim at social recognition than recognition on monetary ground.
- 5) Farmer should adopt an innovation which helps him to get more money.
- 6) A farmer requires only money to achieve most of the goals in life.

14. Management orientation:

A Planning orientation

Agree / Disagree

1. Each year one should think afresh about the crops to be cultivated in each type of land.
2. It is not necessary to make prior decision about the variety of the crop to be cultivated.
3. The amount of seed, fertilizers and plant protection chemicals needed for raising a crop should be assessed before cultivation.
4. It is not necessary to think ahead of the cost involved in raising a crop.
5. One need not consult any agricultural expert for crop planning.
6. It is possible to increase the yield through farm production plan.

B. Production Orientation:

1. Timely planting of a crop ensure good yield.
2. One should use as much fertilizer as he likes
3. Determining fertilizer dose by soil testing saves money.
4. For timely weed control, one should know suitable herbicides.
5. Sees rate should be given as recommended by specialists.
6. With low water rates one should use as much irrigation water as available.

C. Marketing Orientation:

1. Market news is not useful to a farmer.
2. A farmer can get good price by grading his produce.
3. Ware houses can help the farmer to get better price for his produce.
4. One should sell his produce to the nearest market irrespective of the price.
5. A farmer can get better price by processing his produce.
6. One should grow those crops with more market demand.

Yes / UD / No

15. Innovativeness:

1. A good farmer experiments with new ideas in farming.
2. Though it takes time for a farmer to learn new methods it is worth taking the efforts.
3. As soon as you get information regarding a new agricultural practice, will you take immediate decision to put it into practice.
4. If the Government would help you to establish a farm else where would you move.
5. Do you think a farmer, experimenting with his own new ideas, but maintaining his farm/enterprise without loss could be called innovative?

16. Information source utilisation:

Regularly/Sometimes/Never

1. Impersonal source
 - a) Radio
 - b) Newspaper
 - c) T.V.
 - d) Farm magazine
 - e) Farm articles in popular magazines
2. Formal personal source:
 - a) Agricultural Assistants.
 - b) Agricultural Officer.
 - c) Agricultural Scientists.
3. Informal personal source
 - a) Friends & Relatives.
 - b) Neighbours and fellow farmers
 - c) Family members
 - d) Progressive farmers.
 - e) Local leaders.
4. Commercial source
 - a) Fertilizer dealers.
 - b) Pesticide dealers.
 - c) Co-operative officials.
 - d) Bank personnels.
5. Other source
 - a) Exhibitions/Melas/Festivals.
 - b) Group meetings.
 - c) Training.
 - d) Demonstrations.
 - e) Seminars.

17. Information Dissemination Behaviour:

Quite frequently/Frequently/Sometimes/Never

- 1) How many times a week will you convey improved agricultural information to the following persons.
 - a) Family members.
 - b) Friends/relatives.
 - c) Neighbours.
 - d) Fellow cultivators.
 - e) Farmers outside the Village.

18. Knowledge about improved farm practices:

Traits	Crops				
	Paddy	Tapioca	Coconut	Banana	Others
1. Name 2 HYV					
2. Seed rate.					
3. Quantity of organic matter.					
4. Fertilizer dose Basal Top dressing					
5. Name 2 Weedicides.					
6. Name 2 Pests.					
7. Name 2 diseases.					
8. Name 2 insecticides.					
9. Name 2 fungicides.					

19. Adoption of improved agricultural practices.

Traits	Crops					Average
	Paddy	Tapioca	Coconut	Banana	Others	
1. Total area						
2. Total production						
3. Area under HYV						
4. Seed rate						
5. Quantity of organic matter						
6. Application of lime.						
7. Fertilizer Dose						
a) Basal						N P K
b) 1st top dressing						N P K
c) 2nd topdressing						N P K

8. Name of pests and diseases.
9. Period
10. How is it identified
11. Name and quantity of chemical used for preparing spray fluid.

20. Satisfaction:

LTS LS S MS MTS

1. To what extent does your prestige and status satisfy you.
2. To what extent are entertainments presents for your satisfaction.
3. How much satisfied are you with your housing facilities.
4. To what extent are you satisfied in fulfilling your aspirations to achieve better and higher.
5. How much are you satisfied in terms of assistance from state or any agency of state.
6. How satisfactroy is your financial condition?
7. How satisfied are you with your work?
8. To what extent are you satisfied with the educational facilities available to you and your family.

21. Fatalism :

Agree Undecided Disagree

1. Higher yield depends purely on nature's will.
2. Change to new farming patterns or practices often involves greater risk and so put the farmer in loss.
3. Traditional ways of living and farming are age proven and therefore should not be disturbed.

22. Calculability :

Always Sometimes Never

1. When you describe new agricultural information to another farmer, do you think he believes you completely.
2. When other farmers convey agricultural information, do you think they may mislead you.
3. Do you think that the information from agricultural universities / departments can be trusted.
4. When you meet some one for the first time what should you do.
 - * Trust him until he proves to be not worthy of the trust.
 - * Be cautious about trusting him until you know him better.
 - * Not trust him because he may take advantage of you.

23. Social Participation :

Organisation

Membership		Participation						
Past	Present							
Member	Member	Including planning the activities	Organising the activities	Regularly in all organised activities	Somewhat regularly in all organised activities	Occasionally	Rarely	Never
Office bearer	Office bearer							

1. Panchayat
2. Panchayat Union
3. Co-op. marketing society
4. Co-op. Credit society
5. Co-op. milk society
6. Co-op. banks
7. Farmers discussion groups
8. Distinctive features like MLA, MP
9. Others (if any specify)

24. Environmental Orientation :

Statements	Agree / Disagree
1. Indiscriminate use of pesticides cause environmental hazards.	
2. Man is exploiting the earth too much.	
3. Man has to be greatly concerned about environmental issues like pesticide pollution, air pollution water pollution etc.	
4. There is truth in what environmental activists claim and we should lend our support.	
5. The present trend is to reduce use of chemical control measures. Now do you feel that older methods of farming were more safer than present ones.	
6. Agricultural produce obtained without use of chemicals are more tastier and healthier.	

25. Risk orientation :

(Give your degree of agreement for the following statements from "Strongly Agree" to "Strongly Disagree")

Sl. No.	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	A farmer should grow a large number of crops to avoid greater risks involved in growing rice or two crops.					
2.	A farmer should rather take more of chance in making a big profit, than to be content with a smaller, but less risky profit.					
3.	A farmer, who is willing to take greater risk than the average farmer, usually does it better financially.					
4.	It is good for a farmer to take risks when he knows his chance of success are high					
5.	It is better for a farmer not to try farming, unless most other farmers have used it with success					
6.	Trying an entirely new method for a farmer involves greater risk, but is worth it.					

TAXONOMICAL ANALYSIS OF AGRICULTURAL MODERNITY OF FARMERS

By

SREEVALSAN J. MENON

ABSTRACT OF THE THESIS

SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENT FOR THE DEGREE OF
MASTER OF SCIENCE IN AGRICULTURE
(AGRICULTURAL EXTENSION)
FACULTY OF AGRICULTURE
KERALA AGRICULTURAL UNIVERSITY

**DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE
VELLAYANI, THIRUVANANTHAPURAM
1995**

ABSTRACT

This study was undertaken based on the premise that any attempt to design a suitable extension strategy for modernising agriculture requires a thorough understanding of the individual modernity of a farmer. The study area was the Perumbazhuthoor Panchayat and a sample of 120 farmers were randomly selected. The data were collected with the help of a pre-tested interview schedule and suitable statistical tests were applied. The main findings of the study were as follows:

Among the four components *viz.*, socio-psychological behaviour, adoption behaviour, communication behaviour and economic behaviour, adoption behaviour received maximum weight. Nine items (determinants) were selected out of 18 items proposed across the four components. The number of determinants were three under socio-psychological behaviour and two each under adoption, communication and economic behaviour. A composite agricultural modernity index was developed with the nine determinants *viz.*, education, attitude towards scientific cultivation, knowledge, adoption of improved practices, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation. Increase in the nine determinants *viz.*, education, attitude towards scientific cultivation, knowledge, adoption of improved agricultural practices, innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation enhanced CAMI. For every five unit increase in each of the determinants namely education, attitude towards scientific agriculture, knowledge, adoption of improved agricultural practices

innovativeness, information source utilisation, information dissemination behaviour, economic motivation and management orientation, there was one unit increase in CAMI. Nearly two third of the total respondents belonged to the medium modernity level. None of the categories of farmers came under very high modernity level. Two third of the farmers under Category I, II and III belonged to the medium modernity level, and nearly one fourth belonged to the high modernity level. None of the farmers under Category III came under the low modernity level. Almost half of the respondents had high levels of satisfaction and calculability but had low levels of social participation. Nearly two third of the farmers were less environmentally oriented and less fatalistic. Increase in the psychographics, *viz.*, satisfaction, calculability, social participation and environmental orientation enhanced CAMI and a decrease in fatalism enhanced CAMI. For every three unit increase in satisfaction, there was two unit increase in CAMI *ceterisparibus*. For every one unit decrease in fatalism *ceterisparibus*, there would be one unit increase in CAMI. For every two units increase each in calculability and social participation *ceterisparibus*, there were three units increase and one unit increase in CAMI respectively. For every one unit increase in environmental orientation, there were two units increase in CAMI *ceterisparibus*. Increase in the factors *viz.*, farm size, number of enterprises, credit behaviour, cosmopolitaness, training and risk orientation increased CAMI and a decrease in farming experience increased the CAMI. For every one unit increase each in cosmopolitaness, training and risk orientation there was one unit increase in CAMI *ceterisparibus*.